

We prefer a rather coarse sawdust to a fine one for general purposes. The seeds should be sown in well drained pots and watered at least once a day. It must not be forgotten, however, that roots germinating in sawdust or even in moist air or water, are slightly different from those grown in earth. The roots of sawdust cultures present characteristics in their growth which are closely allied to roots grown in moist air.—G. E. STONE, *Amherst, Mass.*

Note on the development of a filamentous form of *Protococcus* in entomostracan appendages. (WITH PLATE XXX.)—While examining a collection of *Sphæroplea annulina* brought in during the latter part of April, a very curious object was discovered under the microscope which at first sight might well have been mistaken for a new algal form. It proved to be fragments of the appendages of some entomostracan, presumably a Branchipus, in which a colony of *Protococcus* had obtained a foothold and was apparently in a very thriving condition.

The plant was an aquatic form, the collection having been made from submerged meadow lands. It agreed in every respect with the description given by De Toni of *Protococcus infusionum* (Schrank.) Kirchn., var. *Roemerianum* (Kuetz.) Hansg. The cells were of a bright green color, globose when free and angular in the crowded portions of the mass; the cell membrane was thin and the contents were homogeneous; the average diameter of the cells was about 10μ .

One fragment of the animal appeared to be a part of the antenna, having two long slender sensory hairs each furnished with one row of spines and a single short hair bearing two rows of spines. A second bit was made out to be probably a portion of the gills. Two lobes were each furnished with a row of hairs about $.5\text{mm}$ in length and 17μ in diameter. These hairs were hollow and were very similar in appearance and size to the two long hairs of the antenna. A mass of *Protococcus* had formed in the broad basal portions of the structures and the cells were so numerous that they were crowded and pressed out of the natural form, becoming angular in outline and giving the appearance of a plate or layer of connected cells. Some of the cells had pushed their way up into the hairs, and undergoing division there had almost entirely filled the hollow lower half of each hair. Every hair then contained from one to four oblong masses of cells each mass being the result of the division of a single cell.

The common form of *Protococcus* consists of single cells lying together in a loose mass. Instead of this we here have filaments each composed of several cells. This is apparently brought about simply by the conditions in which the plant finds itself. Individual cells were forced up into the hairs whose walls, being transparent, gave op-

portunity for the admission of light, air, and moisture sufficient for the further growth and development of the cells. Division then taking place in the only direction possible from the shape of the enclosed space, a row of cells is formed which resembles in a marked manner filaments of *Oscillaria*.

This form of growth then affords a striking illustration of the effect of outward mechanical conditions by the modification into a filament, of cells which under normal conditions exist in simple masses or groups.—JOSEPHINE E. TILDEN, *Botanical Laboratory, University of Minnesota*.

EXPLANATION OF PLATE XXX.—Fig. 1. portions of a gill. Only one lobe is figured, the shape of the other being indicated by dotted lines. $\times 84$.—Fig. 2, one of the hairs from the gill. $\times 450$.—Fig. 3, an antenna. $\times 450$.

Northwestern notes.—*Lathyrus pauciflorus*, n. sp.—Rather slender, two feet or more high: stipules broadly lanceolate and halberd shaped, an inch or more long, a third as wide, acuminate above, acute or obtuse below, usually coarsely toothed; leaflets three to six pairs, thickish, oblong-lanceolate or ovate-oblong, strongly apiculate, almost sessile, one or $1\frac{1}{2}$ inches long: peduncles as long as or longer than the leaves, 3- or 4-flowered: flowers purple, an inch long; calyx teeth ciliate, the middle triangular-lanceolate ones twice as long as the upper triangular ones and two thirds as long as the lower lanceolate tooth; pods not seen.—Collected at Roseburg, Oregon, by Thomas Howell, June, 1887 (no. 677); at Wawawai, Washington, by Lake and Hull, June, 1892 (no. 810); and at Snake River Cañon, Washington, by C. V. Piper, May 27, 1893 (no. 1,487). This species has been confused with *L. polyphyllus* Nutt. from which it is distinguished by its few large flowers, fewer thickish leaves, and narrower stipules.

ROSA NUTKANA Presl, var. *hispida*, n. var.—A form of *R. Nutkana* made conspicuous by its strongly glandular, hispid receptacle and glandular calyx, though not otherwise differing from the type.—Collected at Rock Creek, Montana, by Dr. Watson, July 27, 1880 (no. 124); and at Pullman, Washington, by C. V. Piper, June and Sept., 1893 (no. 1,540).

Calochortus pavonaceus, n. sp.—Stems 10–20 inches high, from a small bulbous base, with a bract in the middle an inch or two long: leaves two-thirds as long as the stem, three or four lines wide, strongly involute in the dried specimens: the 1–4-flowered umbel subtended by as many unequal bracts, the longest rather longer than the pedicels; at least one of the pedicels becoming three inches long: sepals ovate-lanceolate, acuminate, glabrous, $1-1\frac{1}{2}$ inches long, strongly flecked with violet within, the thin scarious margin almost transparent: petals